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first period of the University of Berlin; and as such he received its highest honors. He was chosen its Dean and Rector. The government vied with the University in doing him homage. He was Privy-Councillor, and one of the board of examiners for civil and military service. At court his presence was always welcomed, and no gathering of learned men took place in the palace from which he was missing. He was an officer of the *Legion of Honor*, and at his Jubilee in 1876 he received the star of the *Red Eagle Order*. In 1860 he was made a member of the *Ordre pour le Merite*, and in 1867, by the special favor of his high patron, the King, Vice-Chancellor of the *Friedensclasse* of that Order.

Dove was chosen a member of the Berlin Academy in 1837. He was also an Associate of the Berlin Geographical Society, and contributed to its discussions and publications. After the death of Ritter and Barth, he was the most conspicuous member, and at its forty-fifth anniversary he served as its Honorary President. The name of Dove stands upon the rolls of honor of all the brilliant academies of Europe. His merits were early recognized by this Academy, in 1859, when he was elected a Foreign Honorary Member.

JAMES CLERK MAXWELL.

James Clerk Maxwell, the only son of John Clerk Maxwell, Esq., was born in 1831 at Middlebie in Scotland. His early education was obtained at the Edinburgh Academy, where he was given the academical club medal for geometry in 1845, and the silver medal for mathematics in 1847. After leaving the Edinburgh Academy, Maxwell entered the University of Edinburgh, and was under the instruction of Kelland, Forbes, and Gregory. In October, 1850, he entered at Peterhouse in Cambridge, and in 1854 was made Second Wrangler and bracketed as First Smith's Prize-man. In December, 1850, he left Peterhouse College and entered his name at Trinity, where, in 1855, he became a Fellow. In 1856, he obtained the Professorship of Natural Philosophy in Marischal College, Aberdeen. In 1860, he succeeded Goodeve as Professor of Natural Philosophy and Astronomy in King's College, London. On the death of his father he retired, in 1865, to his estate in Scotland. In 1871, he accepted the chair of Experimental Physics at Cambridge, and was appointed Director of the Cavendish Physical Laboratory, which was built and equipped under his personal supervision. The American Academy of Arts and Sciences of Boston has the honor of being the first of the foreign societies to recognize his merit, by electing him, in 1874, a Foreign Honorary Member. He was elected a member of the American Philosophical Society of Philadelphia in October, 1875; Correspondent in the Mathematical Class to the Imperial Academy of Sciences, Göttingen, in December, 1875; Honorary Member of the New York Academy of Science, in December, 1876; Associate of the Amsterdam Royal Academy of Sciences, in April, 1877; and Corresponding Member of the Imperial Academy of Sciences, Vienna, in August, 1877. He was Fellow of the Royal Societies of London and Edinburgh, and of the Cambridge Philosophical Society.

His principal contributions to science are the following: — Paper on the "Motions of Saturnian Rings" in 1857; "On the Theory of Compound Colours, and the Relations of the Colours of the Spectrum," which obtained the Rumford Medal, and was read before the Royal Society, March 22, 1860; "Dynamical Theory of the Electro-magnetic Field, including a Note upon the Electro-magnetic Theory of Light," read before the Royal Society, Dec. 8, 1864; "Viscosity and Internal Friction of Air and other Gases," Royal Society, Feb. 8, 1866; "Dynamical Theory of Gases," May, 1866; "On a Method of making a direct Comparison of Electro-static with Electro-magnetic Force, with a Note on the Electro-magnetic Theory of Light," in June, 1868.

His little treatise on "The Theory of Heat" is the most unexceptional text-book on physics in the English language. After repeated perusals the reader will still find in it new food for thought. Not only are the abstrusest conceptions put in the simplest language, but also theoretical deductions are illustrated by reference to facts of daily experience. In one place, while speaking of superficial tension, he describes how a heated flat-iron can be used to most advantage in causing a piece of paper to remove a grease-spot. The student will find his various essays in the Encyclopædia Britannica the best popular sources of information upon "The Atom," "Attraction," "Capillary Action," "Constitution of Bodies," "Diagrams," "Diffusion," "Ether," "Faraday," and "Harmonic Analysis." We have enumerated above only a few of his more important papers. He was a frequent contributor to "Nature," among the pages of which will be found many reviews by him; and it is understood that he left many valuable unpublished papers. The most enduring work left by Maxwell is undoubtedly his treatise on Electricity and Magnetism. Since the appearance of this work a new school of physicists has arisen, to whom one might justly apply the title of Maxwellites. They have applied the general theorems of Maxwell to special cases in electricity and magnetism, and have adopted his nomenclature and his methods. The treatise is an exhaustive one, and marks a new era in the history of the development of electro-dynamics. The chief characteristic of Maxwell's mathematical methods is their conciseness. Where Continental mathematicians, contemporary with himself, are diffuse, and occupy pages, Maxwell condenses into a few lines. This condensation makes him a difficult author to read. His constant endeavor is to release himself, as he expresses it, "from the thraldom of Cartesian co-ordinates."

Maxwell was in no sense a narrow mathematician. In one place, in his treatise on Electricity and Magnetism, he says: "It was perhaps for the advantage of science that Faraday, though thoroughly conscious of the fundamental forms of space, time, and force, was not a professed mathematician. He was not tempted to enter into many interesting researches in pure mathematics which his discoveries would have suggested if they had been exhibited in a mathematical form, and he did not feel called upon either to force his results into a shape acceptable to the mathematical taste of the time, or to express them in a form which mathematicians might attack. He was thus left at leisure to do his proper work, to co-ordinate his ideas with his facts, and to express them in natural, untechnical language." Throughout his treatise Maxwell constantly refers to the physical conceptions of Faraday, and claims merely to translate these conceptions into mathematical language. Maxwell and Faraday will go down to posterity together: the work of one cannot be fully interpreted without that of the other.

Maxwell was the first physicist to frame an intelligent and comprehensive electro-dynamic theory of Light. This theory is constantly gaining ground, and the day is probably not far distant when the Professor of Optics will need to supplement his course by a consideration of the relations between the phenomena of electricity and those of light. In molecular physics he was regarded as *facile princeps.*

We have thus rapidly glanced at the few facts which are known in regard to the short life of Maxwell. The great public hardly know his name, and the notice taken of his death by his scientific contemporaries seems hardly worthy of his deeds. He was to the scientific world what a Bismarck or a Gladstone is to the political world. He had no time to devote to popularizing science: this labor was left to men better fitted for it. He represents the highest type of a scientific man, and there are very few such men in any century. Those who knew him say that he was a charming companion, and loved conversation. He was frequently consulted upon knotty scientific points, and his talk, which at first was general, began to turn by degrees to the point in question, and gradually the true solution came forth in a manner which seemed to delight himself as much as the propounder of the question. All speak of his keen sense of wit and humor, and here and there in different periodicals can be found little poems which testify to his versatility of mind. He was, moreover, a very religious man, and showed the fulness of his nature by his deep and reverential interest in all the problems of life and mind which are concerned in a belief in a future state.

EUGENE EMMANUEL VIOLLET-LE-DUC.

THE death of EUGENE EMMANUEL VIOLLET-LE-DUC, in the sixty-sixth year of his age, brought to a sudden close a career of remarkable singleness of purpose, independence of character, industry, and success. He was the son of a well-known archæologist and man of letters, who was attached to the court of Charles X., holding the office of Conservateur des Bâtiments Royaux. Our associate early manifested the remarkable powers of observation and delineation which have added such brilliancy to his achievements in letters and in art. It is said that even in his childhood he used to amuse the king with portraits of the personages about the court. He was educated at the Lycée Bourbon; but instead of going to the École Polytechnique, to which he had been destined, and to which the character of his mind seemed particularly to be adapted, he chose to place himself in the atelier of the architect Achille Leclerc. But though he thus seemed to abandon science for art, it soon appeared that the difference was rather in the subject-matter of his study than in the spirit and aim with which it was to be pursued. He soon found that for the purely æsthetic spirit in which the study of architecture was followed at the École des Beaux-Arts he had but little sympathy. The methods which aimed to develop the creative faculty and the powers of design through the cultivation of the taste and imagination were repugnant to him. Architecture, to his mind, was a thing to be investigated, reasoned out, and thoroughly understood; and he believed that it was to be understood only through a scientific study of the constructive processes upon which it is based, and a scientific study of the monuments that have marked its historical development. Refusing, accordingly, to take